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Lophopsetta maculata. This species is called "sole" locally. It is shipped to Fulton market very early in the season and to quite a considerable extent through April, but later becomes too cheap in the market to pay the fishers to ship them in. I have always considered this a very sweet meated fish, and I usually pick one out for myself in place of the winter flounder. However, locally it is considered a very poor fish and seldom used. One taken in the Bay, March 1, is an early date. Several young, 1 to 2 inches long were taken on December 15 to 17 in the Sound.

Lophius piscatorius. Six adults were taken in the Sound on June 16.

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TESTING FOLK-LORE BY OBSERVATIONS ON BUTLER'S GARTER SNAKE.¹

It sometimes falls to the lot of the naturalist, after many fruitless periods of watching the animals he is studying, to be rewarded by being on hand at the opportune time to observe most unusual occurrences among his subjects. Such an occasion recently presented itself in the little building where for several seasons I have kept certain reptiles under observation. The experiment which I am about to discuss has a bearing upon the oft-raised question as to whether or not individuals among the viviparous snakes ever swallow their young.

If the mother snake of certain species ever does swallow her newly-born young, as popular superstition affirms, it must be that she does it for one of several reasons. One of the explanations offered for such a contra-physiological act is that it is an expedient resorted to for the protection of the offspring in the face of danger. Another suggestion is that the young are swallowed through error in the identification of food.² It hardly need be said that neither

¹ Paper prepared for Third Meeting of the American Society of Ichthyologists and Herpetologists, Cambridge, 1917.

² A case in point is reported by Ditmars. The Reptile Book, p. 375, where he discovered that a female of *Cemophora coccinea* had swallowed her eggs after partial incubation. It is assumed that she mistook them through memory error for the eggs of some other reptile.

of these is critically plausible. Observers of various calibers at various times and in various places have contributed their testimony upon this point, as is well known, but as yet despite all the evidence that has accumulated, very few systematic experiments have been made with the habits of snakes to test the likelihood of some of the minor points of the claim. It has, for instance, been thought possible that the female might under certain circumstances mistake her newly-born litter for legitimate food. This supposition could, of course, apply only in the case of vermivorous or cannibalistic snakes which might in the former instance be deluded optically by the similarity of the appearance of their young to earth worms. In such an event the question arises, would the female actually take food in the period during or immediately after parturition? The observation which I had the fortune to make brings out a certain isolated piece of evidence on this point. It shows that in the case at hand the female will take food during the intervals of giving birth to her young and moreover that she does appear to distinguish between her offspring and the objectively similar appearing food.

In the early summer of this year (1917), I started to keep two pregnant females and one male of Butler's Garter Snake (*Thamnophis butleri*) in a vivarium, under observation for whatever eventualities concerning habits might develop under such conditions. The reptiles had been furnished me for this purpose by Dr. A. G. Ruthven of the University of Michigan. Throughout the summer they fed readily and remained in excellent physical condition, devouring usually from one to three earthworms at each feeding every few days. Gestation proceeded uneventfully until the evening of September 18, when after a chilly rainy day, I happened, about an hour after dark (7:15 P. M.) to cast the rays of light from a lantern upon their cage. One of the females was discharging her young, four of which had already

been born and were lying about on the earth in the cage in various stages of birth. Three of them were endeavoring to remove themselves from their first slough while the last to be delivered was still enveloped in the membrane of birth. Having come to their cage with a supply of freshly dug earthworms, the favorite food of this snake, it entered my mind at once that here was an opportunity to test one of the questions just mentioned. I quietly presented a worm before the head of the mother snake and although she was under-going mild abdominal paroxysms, within a period of about ten seconds she made a movement forward and after a pause of inspection seized the worm and measuredly began to engulf it. The worm which I used was of the same general thickness as the young snakes, one of which was writhing not more than several inches from her head when she seized the worm. I then quietly placed near her head one of her young which she touched with her tongue in the usual way and passed slowly by without giving it any further attention. For about five minutes she remained quiet, then when moving slowly over another earthworm which had been dropped in her way, she seized this as before and swallowed it. It should be noted that her movements were confined to a space on the floor of the cage limited to six inches in extent and that during this time she had passed by some of her young several times and had taken two out of four earthworms in a manner that seemed to show that she was fairly hungry and not disturbed by her physical condition. The main point of the observation is that she discriminated naturally between her young and the earthworms of the same size. After this she paid little attention to other earthworms, and in ten minutes more delivered another foetus; the rest, to the number of six, following, without anything more of interest taking place throughout the night. The last young snake was delivered at 11 A. M. the following

day. During the morning the mother took two more earthworms in the same way as before.

I was much interested, while watching the events just described, in the behavior of the other female¹ and the male in the same company. When the earthworms were placed in the cage the former showed the same symptoms of concern as the other female had and within the first twenty minutes of observation took two of the worms as her companion had done. While scrutinizing the worms at close range, as these reptiles do before seizing them, she nosed some of the newly-born snakes a number of times, attracted by their movements and evidently thinking at first that they were worms. But after a smell or two she too passed them by, a minute later in one instance taking a worm the same size as the little snake. The male snake, shortly after the worms had been introduced into the quarters, showed mild signs of interest and for a minute contemplated one of the worms which passed near him but afterward paid no more attention to them or to the young snakes which also several times touched his body.

I may add that as a last resort in the test I tried to frighten and annoy the mother and young to see what would happen, but she did nothing more than conceal her head beneath a fold of her body.

The experiment was evidently productive of certain modest results as far as these individuals of *Thamnophis butleri* are concerned. The female appeared to be perfectly able to discriminate between her own offspring and similarly appearing food at a time when she was provided with her favorite sort and was besides eager for it. Moreover, the event of parturition did not affect her mood enough to interfere with the gratification of appetite. The fact that the circumstance of time was under control seems to me to be the interesting feature here because the supposition that the female, just after depositing her young,

¹ This individual deposited eleven young on September 29.

if hungry might swallow them by mistake is rendered unlikely since in the experiment all three circumstances, that of delivery, appetite and the presence of food, were simultaneous. Usually these reptiles become a little confused when they are hungry and confronted with food which they seem to smell. At such a time it seems to my mind they would be rather more apt to seize their own young through avidity than under other natural stress of circumstances. The whole evidence has a bearing in the negative upon the almost universal folk-loristic belief that the females of viviparous snakes occasionally swallow their young for some reason shortly after giving them birth.

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Note.—Mr. F. M. Blanchard, of the Museum of Zoology, University of Michigan, is studying the snakes of the genus *Lampropeltis*. He would like to obtain by purchase, exchange, or loan, specimens of any of the species from any locality.

A. G. R.